CLAIMS

1. A method of encoding data in an optical signal including a center wavelength, the method comprising:

directing the optical signal through a filter mechanism having a passband function including a center wavelength; and

modulating the center wavelength of the optical signal to establish a difference between the center wavelengths of the filter mechanism and the optical signal to represent a data value.

2. A method according to Claim 1, wherein the modulating step includes the steps of:

generating a feedback signal representing the difference between the center wavelengths of the filter mechanism and the optical signal; and

using said feedback signal in a feedback loop to modulate the center wavelength of the optical signal to establish said difference between said center wavelengths.

3. A method according to Claim 2, wherein the modulating step further includes the steps of:

generating a dither signal; and

using the dither signal to modulate the center wavelength of the optical signal to establish said difference between said center wavelengths.

4. A method according to Claim 3, wherein the step of using the feedback signal includes the step of using the feedback signal to adjust the dither signal.

5. A method according to Claim 1, further including the step of modulating the optical signal to carry a first set of data, and wherein the step of modulating the center wavelength of the optical signal includes the step of modulating the center wavelength of the optical signal to carry a second set of data.

6. A method according to Claim 5, wherein the optical signal is used in optical network, and the second set of data are information for controlling the transmission of optical signals within the network.

7. A method according to Claim 1, wherein the data are encoded according to one or more protocols selected from the group comprising:

Multi-Protocol Label Switching (MPLS), Tag Switching, Digital Wrapper, Digital Encapsulation, or related protocols.

8. A method according to Claim 1, wherein:

the encoded data are analog data; and the modulating step includes the steps of

i) providing a look-up table having wavelength differences associated with data values,

ii) value, obtaining from the look-up table a wavelength difference for a given data value, and

iii) encoding the given data value in the optical signal by establishing the obtained difference between the center wavelengths of the filter mechanism and the optical signal.

9. Apparatus for encoding data in an optical signal, comprising:

a filter mechanism having a passband function including a center wavelength;

a mechanism for generating an optical signal including a center wavelength and for directing the optical signal to the filter mechanism; and

a modulation system to modulate the center wavelength of the optical signal to establish a difference between the center wavelengths of the filter mechanism and the optical signal to represent a data value.

10. Apparatus according to Claim 9, wherein the modulation system includes a feedback circuit to generate a feedback signal representing the difference between the center wavelengths of the filter mechanism and the optical signal, and to use said feedback signal to modulate the center wavelength of the optical signal to establish said difference between said center wavelengths.

11. Apparatus according to Claim 10, wherein the mechanism for generating the optical signal includes a dither generator for generating a dither signal, and means for applying the dither signal to modulate the center wavelength of the optical signal to establish said difference between said center wavelengths.

12. Apparatus according to Claim 11, wherein the feedback circuit includes means to use the feedback signal to adjust the dither signal.

13. A method of decoding an optical signal including a center wavelength, the method comprising:

receiving the optical signal;

passing the optical signal through a filter mechanism having a passband function including a center wavelength;

generating a difference signal representing the difference between the center wavelengths of the optical signal and the filter mechanism; and

converting said difference signal to a data value.

14. A method according to Claim 13, wherein a dither signal is used to encode data in the optical signal, and the converting step includes the steps of processing said dither signal with said difference signal to obtain a processed difference signal, and converting said processed difference signal to the data value.

15. Apparatus for decoding an optical signal including a center wavelength, comprising:

a filter mechanism having a passband function including a center wavelength;

means for receiving the optical signal and passing the optical signal through the filter mechanism;

a circuit for generating a difference signal representing the difference between the center wavelengths of the optical signal and the filter mechanism; and

a control for converting said difference signal to a data value.

16. Apparatus according to Claim 15, wherein a dither signal is used to encode data in the optical signal, and said circuit includes a subcircuit for processing said dither signal with said difference signal to obtain a processed difference signal, and said control includes means for converting said processed difference signal to the data value.

17. A method of processing an optical signal including a center wavelength, comprising:

modulating the center wavelength of the optical signal to establish a difference between the center wavelength and a predefined wavelength to encode adata in the optical signal;

transmitting the optical signal to a receiving device; and

using the receiving device to process the optical signal to identify the encoded data.

18. A method according to Claim 17, wherein the using step includes the steps of:

at the receiving device,

a. generating a difference signal representing the difference between the center wavelengths of the optical signal and a defined value, and

b. converting the difference signal to a data value.

19. Apparatus for processing an optical signal, including a center wavelength, comprising

a transmit device for modulating the center wavelength of the optical signal to establish a difference between the center wavelength and a predefined wavelength to encode data in the optical signal, and to transmit the optical signal; and

a receive device for receiving the optical signal from the transmit device and to process the optical signal to identify the encoded data.

20. Apparatus according to Claim 19, wherein the receive device includes:

a first circuit to generate a difference signal representing the difference between the center wavelength of the optical signal and a defined value, and

a second circuit to convert the difference signal to a data value.